281 is treated by the method used for making chamois leather. First of all, the hide is stretched tight on the ground with pegs all around the edges. With a knife the hair and the particles of meat and fat still attached to it are scraped off carefully. When the hide is almost dry, the pegs are removed, it is rubbed with fat or butter and then beaten thoroughly, piece by piece, with both hands until it has become smooth and pliable (No. 19, p. 425). Finally the hide is rubbed with a little white residual soil (kaolin) so as to give it a nice appearance. Hides to be used as blankets are treated in the same manner, but the hair is not removed.

326 177 In the field of ironwork the performance of the Barundi is good, even excellent. This is really surprising since reportedly the forging technique was brought to Urundi from the northeast, probably from Kissaka, at the time of King Ruganza of Ruands, i.e., approximately 200 years ago. The art was introduced, it is said, by a legendary person, Kigwe. [412] [411] Van der Burgt writes me that "before that period wooden hoes were used for cultivating the soil, and arrows and spears were made entirely of wood." An old Mutwa told van der Burgt that in his youth he had seen such wooden utensils himself. According to my observations such wooden hoes and weapons do not exist any more. Van der Burgt is mistaken in assuming that 135 316 325 the backwardness of the Urundi iron industry can be explained by the fact that there are no iron ore deposits in Urundi (No. 19, p. 250). I found excellent iron (itschjuma) in the form of limonite and specular iron ore in many places. On the other hand, I can confirm that the Barundi do not know how to mine and smelt these local iron ores. In Ruanda I saw smelting furnaces in full operation, but there are none in Urundi. The 326 [439] Barundi blacksmiths only work iron imported from other areas. Some of it is imported in the form of hoes from Usindja (southern part of Lake Victoria) with the help of the Baha and Bassuwi, and some of it is European iron wire which is brought into the country by way of Lake Tanganyika. The Bahutu and Batwa blacksmiths convert this imported iron into the forms of hoes, knives, chopping knives, spear points, arrowheads, arm

326 rings, etc., which are customary in the country. The Bahutu and the Batwa use the same technique, but apparently the Batwa are the more adroit blacksmiths. In Urundi blacksmiths do not form a special guild, but in some families the craft is passed on from one generation to the other. Blacksmiths live [554] with the other Barundi, and because of their craft they are highly respected. They are professional craftsmen who sell [84] their merchandise, but as in Ruanda, they often also engage in agriculture on the side. [Fig. 17 appears here in the original text.]

325 [348] The work shop (uruganda) is a small round hut, open on all sides. In its center a hollow in the ground contains the [372] charcoal fire. Since blacksmiths need charcoal for their craft and since there are few trees in this country, they mostly have their huts not far from the remains of forests or the bushes along the rivers. Charcoal from the peripheral mountains wrapped [438] in long bundles of banana leaves is sold in the interior. Next to the fireplace there are bellows, either vessel or bowl bellows (umuvuba), shaped like a large, double wooden spoon, over each of whose ends a goatskin is stretched loosely (No. 2 of Plate 45). A wooden stick is tied to the center of each skin; it serves as a piston whose upward and downward movements press the air from the vessel into the end of the pipe. The blower stands or squats behind the bellows holding a piston in each hand which he alternately moves up and down quickly. The same type of bellows is used in Ruanda where it is also used for blowing the smelting furnaces. In Urundi (according to Stuhlmann's small map in No. 32a, p. 62), still another type is said to exist, the tube or bag bellows; yet I have not been able to find out anything about it. The more common vessel bellows just described is carved from a single block of wood and opens into a short, funnel-shaped clay pipe which is placed directly amotig the hot coals and keeps them glowing. From time to time water is sprinkled on the glowing pile of coal.

[85] On the other side of the fireplace there is a hard stone which serves as an anvil (Fig. 17). The piece of iron which is to be forged is pushed into the glowing coals with a wet, clamp-like piece of wood or with a pointed iron pin, and it is pulled

[Text continues on page 128]

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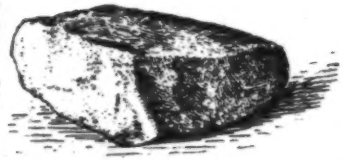
325



Stone Anvil

Pin for Engraving Ornaments.

File

Iron Hammer.

Iron Bolt for Forging Concave Forms.

Fig. 17.

(All 5 figures in the Ethnological Museum, Berlin, No. 6386.)

325 out with the same instrument. Once on the anvil, the iron is forged with the hammer (injondo), a heavy piece of iron with several edges. It has no wooden handle but is elongated on one end to form a kind of handle so that it may be gripped firmly. The iron is hammered and intermittently made red-hot until it has been purified of all dross. Then it is forged with the 325 hammer into the shape of the desired object. For this purpose 412 any of the following auxiliary tools are used: a thick, rounded pin over whose curved head the glowing piece of iron is hammered into concave shapes, e.g., bells, sleeves for spear points, etc.; a short pointed piece of iron with which simple patterns of dots are engraved in arm rings, chopping knives, and other objects; an old knife to cut pieces of glowing iron in two by using it like a wedge and hitting it with the hammer; a file consisting of a serrated piece of iron with a wooden handle with which any unevenness is rasped off the forged objects after they have cooled down; and finally a few hard, smooth stones for polishing.

[439] I have not been able to ascertain whether the Barundi are familiar with wiredrawing. They use imported European types of iron, copper, or brass wire to wind around their bracelets and knife sheaths.

325 Copper (umurinda) and brass are hardly used at all in 439 Urundi, with the exception of the Tanganyika district where copper and brass have been imported from the Congo (for instance, Katanga) for years and are used for many purposes. In [316] the large interior areas of Urundi no copper ore is mined. The small amount of copper imported from Tanganyika in the form [301] of wire is hammered out cold and used for making simple bracelets, small bells used as dangling ornaments, small pieces of foil used as inlays for the large wooden arm discs, and other things. Both in Urundi and Ruanda the casting of iron in molds is unknown.

2: Meyer--279 K-5 (1911) 1916 FO42 Rundi FO42

Plate 45

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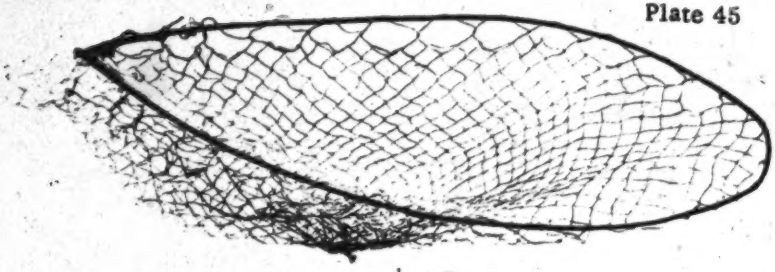

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[415]

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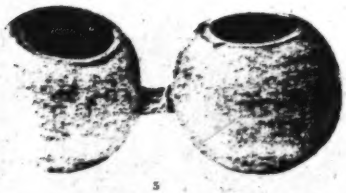

[415]

Implements Used in the Household, Fishing, and Field Work;

No. 1) Fish net of bast strings, 120 centimeters long; No. 2) Vessel bellows of wood and goat skin, 97 centimeters long; No. 3) Wooden milk bottle, 28 centimeters; No. 4) Iron cattle bell, 14 centimeters; No. 5) Wooden double container for butter, 20 centimeters wide.

322 412 The tools used for this work are the ax (Figs. 29, 30), the bush knife (Fig. 31), the percussion drill, the hollow hatchet in various sizes with diagonal cutting edges, and the rasp for scraping the interior and surface of objects.

325 316 439 Metal Industry. The two types of metalwork in Ruanda are the ordinary blacksmith's art and wire drawing. Iron mining is of no importance; the inhabitants are dependent almost entirely on imported metal. Iron is imported from Buindja and from the Congo state in the form of hoes. I saw a few abandoned mines on Mount Ndisa, and there is some iron in Kissaka. Dr. Kandt (1) even reports a blast furnace with 16 bellows. Bgisha

1. Ibid., p. 360.

is said to be considerably richer in iron, but it seems to me that it chiefly mediates the importation of Congo iron.

326 The smiths form a sort of guild in Nduga. They are all Bahutu, but they belong to different clans even though their occupation is generally hereditary.

Smiths are very much feared throughout the country, although one cannot deny that their trade is regarded with a certain scorn. Among the Bahutu the smiths enjoy their wealth because of an undeniable influence. Women, for example, seem to regard smiths as great cavaliers and men of the world who always drink beer to excess. In general, however, they are regarded as restless spirits and eternal rebels, nor are they especially praised for their honesty. In view of this, they are carefully watched at their work when, as is usually the case, they are furnished with raw materials by the customers. It is said that they filch iron whenever they can and have a very bad reputation in this respect.

[847] Aside from their regular trade, the smiths also practice gynecology, and they are noted for their skill in performing abortions. They also play a prominent part in the cult. The head of the royal smiths is said to have a high position and to play an important role in court ceremonies.

●325 [156] A smith's tools consist of bellows, iron hammers, and a stone anvil, besides lesser tools such as an earthen pot for water, a brush to sprinkle the coals when the surface begins to glow, and pieces of wood to clamp together the red-hot iron.

In Kissaka the bellows (see Plate 12, Vol. III) is a clay vessel, the bottom of which is elongated to form a rather long horizontal pipe. The upper opening of the pot is covered with a goat skin in such a way that a stick at the center can either

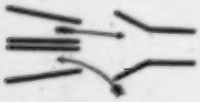

Fig. 48. Diagram of Air Circulation between Bellows and Funnel.

raise it or lower it in the pot. The resulting change in size of the area covered causes a shifting current of air in the horizontal pipe leading out of the bottom. Two bellows form one unit operated by one man and adequate for ordinary forging work. Dr. Kandt (1) shows an illustration of a double wooden bellows which

1. Kandt, R., "Gewerbe in Ruanda," Zeitschrift für Ethnologie, 1904, p. 362.

I repeatedly saw only in north Ruanda and among the Bakondjo [Konjo]. A clay funnel sunk into the hearth is laid in front of the openings of the two bellows. Puffs of air produced by rapidly pressing down the skin-membrane are directed into the funnel alternately from the two openings. According to the pressure thus produced, the draft reaches the center of the hearth by way of the funnel, whereas the air sucked into the bellows comes through the space between the funnel and the bellows. In this manner primitive bellows without valves direct air through a funnel to the center of the hearth.

[157] The hammers, including the handle, are made from one piece of iron. The handle is round in cross section, whereas the hammer has four ribs for pounding, producing an X-shape in cross section.

●325 The anvil is a flat stone. The smiths sit on similarly shaped stones beside the anvil while they work.

They do not use tongs. The red-hot iron is set into banana stalks which have a high moisture content, and thus the iron can be held in the hand while being forged. If the object being forged happens to have a point, the latter is driven into a piece of wood, and with this improvised handle it can be held quite comfortably.

To cut off a piece of iron, they bend it in both directions until it breaks and falls apart. The edges and the rough surfaces of the anvil are also used in forging. For example, if the iron is to be cut in two at a certain point, that portion is hammered thin, repeatedly [157] bent in both directions, and finally laid over a hollow portion of the anvil and separated with a few light blows.

[306] The rather highly developed jewelry industry requires a considerable production of very thin iron and copper wire. This is wound around bracelets and anklets.

The piece of metal is first forged into a thick, uneven piece of wire, and later this is drawn out to the desired thinness.

The actual wire drawing is done without heat. Forged wire is repeatedly drawn through a cone-shaped hole in an iron bolt. The narrower outlet of the bolt is gradually made smaller as the soft metal is hammered. As the wire is pulled through, the edges of the bolt yield more and more, so that the wire is thicker at the end than at the beginning. To counteract this, the wire is alternately pulled through the bolt in the reverse direction.

After the opening of the bolt has been narrowed by hammering, first of all the uneven edges must be smoothed. For this purpose a well-sharpened needle set into a wooden handle is used. The needle is put into the opening of the bolt from both sides and twisted around. Then the end of the wire is filed so that it can be threaded into the bolt. Thereupon the protruding end of the wire is clamped down with a special device. The wire is drawn without the use of pincers.

The clamp used in place of pincers consists of a V-shaped piece of iron. The protruding bit of wire is placed between the two branches of this V-shaped piece and clamped by means of an iron ring set on the V. The clamp must then be drawn slightly away from the bolt. After this, while the wire is still sufficiently

325 thick and strong, the bolt is supported against a forked tree trunk set in the ground. This is why the outer edges of the bolt are cut to shape at both ends. This preparation prevents slipping because these parts can fit more exactly in the notches on the wooden fork.

The clamp is grasped, for the sake of comfort, with a loop made of banana leaf sheaths, and it is drawn the length of a meter. Afterwards a loop is wound around the wire itself. This loop is knotted in such a way that in pulling back with the hand closed it grasps the wire and pulls it, but at the same time it slides easily in the direction of the bolt. Drawing the wire close to the bolt prevents it from breaking. In the case of fine, weak, thin wire, the clamp is supported against the wooden fork and the bolt drawn along the wire by hand. If any section of the wire offers resistance, the wire is slid back and forth.

[287] [413]

Fig. 49. Barkcloth Beater, Ruanda. (1/6 actual size. III E 9964.

Fig. 50. Barkcloth Beater, Mulera. (1/6 actual size. III 13105. 34.5 centimeters long.)

[158] Thick wire is heated for drawing; but the temperature is very low since the main operations, such as filing the point and clamping, are done by hand. Thick wire is rubbed with stones as it is being drawn; the worker takes a handful of stones and repeatedly rubs them along the wire. This is reputedly done to impede the movement of the wire and thus draw it out more. Thin wire is smeared with fat to keep it from getting stuck, which might cause it to break.

The finished wire is rolled into large coils.